**ENVIRONMENTAL** PRODUCT DECLARATION

# ASSA ABLOY SL500 ECODOOR NARROW STILE

ASSA ABLOY ENTRANCE SYSTEMS

The ASSA ABLOY EcoDoor narrow stile automatic sliding door system is suitable for low traffic to high pedestrian traffic flow. The door system is available with a variety of configurations and features to help you meet your sustainability goals. Whether air infiltration reduction, energy consumption savings, improved customer comfort or compliance with energy codes such as ASHRAE 90.

ASSA ABLOY

ASSA ABLOY is committed to providing products and services that are environmentally sound throughout the entire production process and the product lifecycle. Our unconditional aim is to make sustainability a central part of our business philosophy and culture, but even more important is the job of integrating sustainability into our business strategy. The employment of EPDs will help architects, designers and LEED-APs select environmentally preferable door openings. ASSA ABLOY will continue our efforts to protect the environment and health of our customers/end users and will utilize the EPD as one means to document those efforts.

Institut Bauen und Umwelt e.V.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

# ENVIRONMENTAL PRODUCT DECLARATION

ASSA ABLOY

*ASSA ABLOY Entrance Systems*
*ASSA ABLOY SL500 EcoDoor narrow stile*

**According to EN 15804 and ISO 14025**
**Dual Recognition by UL Environment and Institut Bauen und Umwelt e.V.**

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.


| | |
|---|---|
| PROGRAM OPERATOR | UL Environment |
| DECLARATION HOLDER | ASSA ABLOY Entrance Systems US Inc |
| ULE DECLARATION NUMBER | 4786545067.159.1 |
| IBU DECLARATION NUMBER | EPD-ASA-20180085-IBC1-EN |
| DECLARED PRODUCT | ASSA ABLOY EcoDoor narrow stile |
| REFERENCE PCR | PCR Automatic doors, automatic gates, and revolving door systems (door systems Version 1.5 (04.2017) |

| | |
|---|---|
| DATE OF ISSUE | June 22, 2018 |
| PERIOD OF VALIDITY | 5 years |

| | |
|---|---|
| SCOPE | This EPD is Manufacturer Declaration (1a) – Declaration of a specific product from a manufacturer's plant. The owner of the declaration shall be liable for the underlying information and evidence. |
| CONTENTS OF THE DECLARATION | Product definition<br>Information about basic material and the material's origin<br>Description of the product's manufacture<br>Indication of product processing<br>Life cycle assessment results<br>Testing results and verifications |

| | |
|---|---|
| The PCR review was conducted by: | IBU – Institut Bauen und Umwelt e.V.<br>PCR was approved by the Independent Expert Committee-Dr. Wolfram Trinius appointed by SVA) |
| The CEN Norm EN 15804 serves as the core PCR. This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories<br>☐ INTERNAL ☒ EXTERNAL | Grant R. Martin<br>Grant R. Martin, UL Environment |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by: | IBU – Institut Bauen und Umwelt e.V. |

Environment

ASSA ABLOY

# 1. General Information

| ASSA ABLOY Entrance Systems US Inc | ASSA ABLOY SL500 EcoDoor narrow stile |
|---|---|
| **Program holder**<br>IBU - Institut Bauen und Umwelt e.V.<br>Panoramastr. 1<br>10178 Berlin<br>Germany | **Owner of the Declaration**<br>ASSA ABLOY Entrance Systems US Inc<br>1900 Airport Road<br>Monroe, NC 28110 United States |
| **Declaration number**<br>EPD-ASA-20180085-IBC1-EN | **Declared product / Declared unit**<br>This declaration represents 1 automatic sliding door system ASSA ABLOY SL500 EcoDoor narrow stile consisting of 2 active door leaves with frame height (79”/[2.0 m]), frame width (48”/[1.2 m]) and (1”/[25 mm]) insulated tempered glass and 2 stationary doors with frame height (83”/[ 2.1 m]), frame width (48”/[1.2 m]) and (1”/[25 mm]) insulated tempered glass. |
| **This Declaration is based on the Product Category Rules:**<br>IBU: PCR Automatic doors, automatic gates and revolving door systems (door systems) version 1.5 (04.2017)<br>(PCR tested and approved by the independent expert committee) | **Scope:**<br>This declaration and its LCA study is relevant to the ASSA ABLOY SL500 EcoDoor narrow stile. - The final assembly and production stage occurs in Monroe NC, USA at 1900 Airport Road. Components are sourced from international tier one suppliers. ASSA ABLOY SL500 EcoDoor narrow stile sizes vary according to project requirements. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. |
| **Issue date**<br>22.06.2018 | |
| **Valid to**<br>21.06.2023 | |
|  <br>Prof. Dr.-Ing. Horst J. Bossenmayer<br>(President of Institut Bauen und Umwelt e.V.) | **Verification**<br>The CEN Standard EN 15804 serves as the core PCR<br>Independent verification of the declaration and data according to ISO 14025<br>☐ internally ☒ externally |
|  <br>Dr.-Ing. Burkhart Lehmannt<br>(Managing Director IBU) |  <br>Dr. Wolfram Trinius<br>(Independent tester appointed by SVA) |

# 2. Product

### 2.1 Product description

**Product name:** ASSA ABLOY SL500 EcoDoor narrow stile.
**Product characteristic:** Automatic sliding door system.

ASSA ABLOY Entrance Systems EcoDoor sliding systems are suitable for low traffic to high pedestrian traffic flow. The sliding door systems are available in several configurations and designs, depending on application and facility requirements.

The system consists of a support structure, door leaves with foam, glazed glass, automatic door operator and safety units.

Automatic sliding door systems are made mainly of aluminum, steel and glass. The main function of the narrow stile door packages is to match the existing appearance of the building/storefront.

The ASSA ABLOY SL500 EcoDoor narrow stile system can be provided with optional 25 mm glass stops to accept insulated glass.

The ASSA ABLOY SL500 EcoDoor narrow stile has been designed to meet all operational and safety requirements in the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) and Underwriters Laboratories (UL).

The standards that can be applied for ASSA ABLOY SL500 EcoDoor narrow stile are:

ANSI/BHMA A156.10 Power Operated Pedestrian Doors
UL 325 ANSI/CAN/UL Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems
UL 60730 UL Standard for Safety Automatic Electrical Controls
NFPA 79 Electrical Standard for Industrial Machinery
AHSRAE 90.1 ANSI/ASHRAE/IES Standard 90.1-2016 -- Energy Standard for Buildings Except Low-Rise Residential Buildings

### 2.2 Application

The ASSA ABLOY SL500 EcoDoor narrow stile is an automatic sliding door system suitable for high traffic use. It combines convenience, safety and dependability to maximize performance along its life cycle. The door system is designed to minimize unwanted air infiltration, improve the indoor climate and ensure safe and convenient entry and exit for all- regardless of age and physical capabilities.

The SL500 Ecodoor narrow style finds its use inoutdoor applications in retail, transportation, healthcare, manufacturing, public sector, etc. where pedestrian safety is of high concern.

The system is designed to handle changing weather conditions and environmental variations.

### 2.3 Technical Data

The table presents the technical properties of the SL500 EcoDoor narrow stile:

**Technical data**

| Name | Value | Unit |
|---|---|---|
| Heat transfer coefficient of the entire door or gate system | 0,64 | W/(m$^2$K) |
| Power input "Standby" | 40 | W |
| Power input "Idle" | 40 | W |
| Power input "Operation" | 71 | W |

**Features**

Max size door leaf (bi-parting): (DW x DH) 1230 x 2100 mm (larger sizes available on request)
Clear opening: Bi-parting: SL500-2: 920– 2125 mm
Clear opening: Single Slide: SL500-R/L: 900 – 1200 mm
Door leaf thickness: 48 mm
Door leaf material: glass and aluminum
Profile type: - aluminum
Profile finish: - Clear and Dark Bronze
- Painted finished available
Glass type: - 6.35, 16 or 25 mm tempered glass

**Performance**

Mains power supply: 100 V AC -10% to 240 V AC +10%, 50/60 Hz, fuse 10 AT (building installation)
Power consumption: Max 250 W
Auxiliary voltage: 24 V DC, 1 A

On door package (as shown in the table) ‘standby’ means the door is operational and will open/close once someone enters the door, ‘idle’ means the door is locked but there is still power to the electronics and ‘off’ means the doors will not move automatically (can move doors manually) but there is still power to the electronics.

Opening/closing speed: SL500: Variable up to approx. 1.4 m/s (SL500-2)
Hold open time: 0-60 s

Recommended max.door weight: Bi-parting without break-out: SL500-2: 200 kg/leaf
Recommended max.door weight: Single Slide without break-out: SL500-R/L 240 kg
For low energy movement: 150 kg/leaf

Ambient temperature: -20 °C to +50 °C

### 2.4 Delivery status

The ASSA ABLOY SL500 EcoDoor narrow stile is delivered ready for installation.

### 2.5 Base materials / Ancillary materials

The composition for ASSA ABLOY SL500 EcoDoor narrow stile is as following:

| Component | Percentage in mass (%) |
|---|---|
| Aluminum | 14.17 |
| Brass | 0.00 |
| Plastics | 0.75 |
| Steel | 54.85 |
| Glass | 29.28 |
| Electro-mechanics | 0.87 |
| Others | 0.08 |
| **Total** | **100** |

### 2.6 Manufacture

Profiles are provided by Tier-1 supplier located in Fonda NY and are delivered to the factory in Monroe, NC USA. The profiles are machined. The products are surface treated; either anodized (externally), powder coated (externally) or Kynar (externally). Other parts as electronics, brackets, etc. arrives from tier-1 suppliers or a factory overseas then a basic assembly is done in Monroe. The door system components are encased in cardboard and forwarded to on-site installation.

### 2.7 Environment and health during manufacturing

ASSA ABLOY Entrance Systems US Inc. is committed to producing and distributing door opening solutions with no environmental impact, where health & safety is the primary focus for all employees and associates.
• Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and the effectiveness of Environment Management program is evaluated.
• Code of Conduct covers human rights, labor practices and decent work. The Management of ASSA ABLOY Entrance Systems US Inc. is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.

• Preparation and manufacturing conditions in the factory of Monroe do not require special health and safety measures. Standard health and safety measures (work gloves, hearing protection, safety shoes, dust mask when sanding and milling, dust extraction, etc.) are observed where appropriate.

• Water and soil contamination does not occur and all production related waste is processed internally in the appropriate manner.

### 2.8 Product processing/Installation

The ASSA ABLOY SL500 EcoDoor narrow stile are supplied ready for installation. The frame as well as the door leaves are assembled in factory and installed on-site by using simple tools including drills and hand tools. The installation is performed by certified installation technicians.

### 2.9 Packaging

Packaging exists for the purpose of protection during transportation. ASSA ABLOY Entrance Systems sliding door systems are initially packaged in corrugated cardboard. The packaging does not return to the manufacturer meaning it stays at the site. All packaging is recyclable.

| Material | Value (%) |
|---|---|
| Cardboard/ Paper | 100 |
| **Total** | **100.0** |

### 2.10 Condition of use

Regular inspections shall be made according to national regulations and product documentation by an ASSA ABLOY Entrance Systems trained and qualified technician. The number of service occasions should be in accordance with national requirements and product documentation. Service is recommended according to "Service Log Book.

Regular inspections and cleaning should be performed by the owner of the product, according to "Owner's Manual"

The best way to remove dust and dirt from the ASSA ABLOY SL500 EcoDoor narrow stile is to use water and a soft cloth or a sponge. A gentle detergent may be used. To maintain the quality of the enamel layer, the surfaces should be cleaned once/four months period. The cleaning should be documented. To avoid damages to the profiles, the brushes/weather stripping must be vacuum-cleaned weekly.

• Do not expose windows, doors or profiles to alkalis. Both aluminum and glass are sensitive to alkalis.
• Do not clean with high pressure water. Operator, program selector and sensor may be damaged and water may enter the profiles.
• Do not use polishing detergent.
• Do not scrub with materials like Scotch-brite, as this will cause mechanical damage.

### 2.11 Environment and health during use

There is no harmful emissive potential. Minimal risk for personal injury if correctly configured and maintenance recommendations applied.

### 2.12 Reference service life

The product has a reference service life of more than 1,000,000 cycles and 10 years of standard daily use (with the recommended maintenance and service program) For this EPD lifetime of 10 years was considered.

### 2.13 Extraordinary effects

**Fire**

No standardized test has been conducted. The product wall surfaces however consist of a large amount of aluminum and glass which does not add to the spread of fire."

**Water**

Contains no substances that have any impact on water in case of flood. Electric operation of the device will be influenced negative.

**Mechanical destruction**

No danger to the environment can be anticipated during mechanical destruction.

### 2.14 Reuse stage

The product is possible to re-use during the reference service life and be moved from one entrance to another. The majority, by weight, of components is aluminum alloy, steel and glass which can be recycled. The plastic components can be used for energy recovery within a waste incineration process.

### 2.15 Disposal

The product contains mostly steel, glass, aluminum which are all possible to recycle. Where no waste recycling technologies are available, the product can be placed in a landfill site.

### 2.16 Further information

ASSA ABLOY Entrance Systems US Inc
1900 Airport Road
Monroe, NC 28110 United States
www.assaabloyentrance.com

# 3. LCA: Calculation rules

### 3.1 Declared Unit

The declaration refers to the functional unit of 1 automatic sliding door system ASSA ABLOY SL500 EcoDoor narrow stile as specified in Part B requirements on the EPD for PCR Automatic doors, automatic gates, and revolving door systems (door systems).

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Mass (without packaging) | 387.09 | kg |
| Mass packaging (paper) | 8.25 | kg |
| Conversion factor to 1 kg | 0.002583 | - |
| Declared unit for revolving door systems (dimensions acc. to this PCR) | 1 | piece |

### 3.2 System boundary

Type of the EPD: cradle to gate - with Options
The following life cycle stages were considered:

Production stage:

- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer and
- A3 – Manufacturing

Construction stage:

- A4 - Transport from the gate to the site
- A5 – Packaging waste processing

Use stage related to the operation of the building includes:

- B6 – Operational energy use

C1-C4 End-of-life stage:

- C2 – Transport to waste processing,
- C3 – Waste processing for recycling and
- C4 – Disposal (landfill, waste for incineration).

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

Module D:

- Declaration of all benefits and loads

### 3.3 Estimates and assumptions

Transportation: Data on mode of transport and distances, as reported by suppliers were used for those materials and parts contributing more than 2% of total product mass. In case of unknown transport distances for parts and materials, contributing less than 2% to the total product mass, transport by road over an average distance of 500 km was assumed.

Use stage:
For the use stage, it is assumed that the sliding door is used in US, thus a US electricity grid mix is considered within this stage. According to the most representative scenario, the operating hours of the product are accounted for 2130 hours in on mode, 2130 hours in standby mode and 4260 hours in idle mode per year; the power consumption throughout the whole life-cycle is 4068 kWh.

EoL:
In the End-of-Life stage, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed. The country where EoL takes place is the US. Furthermore, a transport distance by truck of 100 km has been assumed in the model.

### 3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts.

Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

### 3.5 Background data

For life cycle modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 6 2013D/.
To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.

### 3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR Part A/.
thinkstep performed a variety of tests and checks during the entire project to ensure high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used.
The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.
All relevant background datasets are taken from the GaBi 6 software database.

### 3.7 Period under review

The period under review is 2015/16 (12-month average).

### 3.8 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. In this EPD, the following specific life cycle inventories for the WIP are considered for:

- Waste incineration of plastic
- Waste incineration of paper

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D. Specific information on allocation within the background data is given in the GaBi dataset documentation.

### 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account. GaBi 6 serves as background database for the calculation.

## 4. LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

**Transport to the building site (A4)**

| Name | Value | Unit |
|---|---|---|
| **Truck transport** | | |
| Litres of fuel diesel with maximum load (27t payload) | 39.4 | l/100km |
| Transport distance truck | 1042 | km |
| Capacity utilization (incl. empty runs) of truck | 85 | % |

**Installation into the building (A5)**

| Name | Value | Unit |
|---|---|---|
| Output substances following waste treatment on site (Paper packaging) | 8.25 | kg |
| Output substances following waste treatment on site (Plastics packaging) | 0.000 | kg |

**Reference service life**

| Name | Value | Unit |
|---|---|---|
| Reference service life | 10 | a |

**Operational energy use (B6)**

| Name | Value | Unit |
|---|---|---|
| Electricity consumption per RSL (10years, 365 days per year) | 4068.3 | kWh |
| Hours per day in on mode | 6 | h |
| Hours per day in stand-by mode | 6 | h |
| Hours per day in idle mode | 12 | h |
| Power consumption – on mode | 71 | W |
| Power consumption – stand-by mode | 40 | W |
| Power consumption – idle mode | 40 | W |

*Total energy consumed during the whole product life was calculated using following formula:

*(W_active_mode*h_active_mode+W_idle_mode*h_idle_mode+W_stand_by_mode*h_stand_by_mode)*Life_span*days_year*0.001*

**Where:**

- W_active_mode - Energy consumption in active mode in W
- h_active_mode - Operation time in active mode in hours
- W_idle_mode - Energy consumption in idle mode in W
- h_idle_mode - Operation time in idle mode in hours
- W_stand_by_mode - Energy consumption in stand-by mode in W
- h_stand_by_mode - Operation time in stand-by mode in hours
- Life_span - Reference service life of product
- days_year - Operation days per year
- 0.001 - Conversion factor from Wh to kWh.

**End of life (C1-C4)**

| Name | Value | Unit |
|---|---|---|
| Collected separately Aluminium, steel, electro mechanics, brass and plastic parts | 270.095 | kg |
| Incineration of plastic parts | 2.92 | kg |
| Recycling Aluminium, brass, steel, electronic, electro-mechanics | 267.18 | kg |

**Reuse, recovery and/or recycling potentials (D), relevant scenario information**

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type (including packaging) | 281.70 | kg |
| Recycling Aluminium | 19.48 | % |
| Recycling Brass | 0.0003 | % |
| Recycling Steel | 75.37 | % |
| Recyling Electro mechanics | 1.19 | % |
| Incineration of Plastic parts | 1.037 | % |
| Incineration of packaging (paper) (from A5) | 2.93 | % |

## 5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 Methodology.

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)**

| PRODUCT STAGE | | | CONSTRUCTION PROCESS STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement[1)] | Refurbishment[1)] | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| X | X | X | X | X | MND | MND | MND | MND | MND | X | MND | MND | X | X | X | X |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One **piece of automatic sliding door system**

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP | Global warming potential | [kg $CO_2$-Eq.] | 1,45E+03 | 1,97E+01 | 1,17E+01 | 2,73E+03 | 1,85E+00 | 6,81E-01 | 1,00E+01 | -8,75E+02 |
| ODP | Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 1,95E-06 | 9,45E-11 | 5,34E-11 | 9,46E-07 | 8,88E-12 | 4,66E-10 | 4,54E-11 | 2,50E-07 |
| AP | Acidification potential of land and water | [kg $SO_2$-Eq.] | 7,13E+00 | 9,03E-02 | 2,66E-03 | 9,23E+00 | 8,49E-03 | 3,21E-03 | 1,23E-02 | -4,39E+00 |
| EP | Eutrophication potential | [kg $(PO_4)^{3-}$-Eq.] | 5,27E-01 | 2,06E-02 | 4,65E-04 | 4,93E-01 | 1,94E-03 | 1,81E-04 | 1,58E-03 | -2,53E-01 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | [kg Ethen Eq.] | 6,17E-01 | -2,91E-02 | 1,89E-04 | 5,65E-01 | -2,74E-03 | 1,91E-04 | 1,06E-03 | -3,65E-01 |
| ADPE | Abiotic depletion potential for non-fossil resources | [kg Sb Eq.] | 2,05E-02 | 7,44E-07 | 2,11E-07 | 3,61E-04 | 6,99E-08 | 9,42E-08 | 1,30E-06 | -1,26E-02 |
| ADPF | Abiotic depletion potential for fossil resources | [MJ] | 1,60E+04 | 2,72E+02 | 3,27E+00 | 3,15E+04 | 2,56E+01 | 7,73E+00 | 2,45E+01 | -8,30E+03 |

**RESULTS OF THE LCA - RESOURCE USE:** One piece of automatic sliding door system

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | Renewable primary energy as energy carrier | [MJ] | 3,10E+03 | - | - | - | - | - | - | - |
| PERM | Renewable primary energy resources as material utilization | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PERT | Total use of renewable primary energy resources | [MJ] | 3,10E+03 | 1,07E+01 | 3,05E-01 | 3,08E+03 | 1,01E+00 | 2,21E+00 | 2,09E+00 | -2,17E+03 |
| PENRE | Non-renewable primary energy as energy carrier | [MJ] | 1,83E+04 | - | - | - | - | - | - | - |
| PENRM | Non-renewable primary energy as material utilization | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PENRT | Total use of non-renewable primary energy resources | [MJ] | 1,83E+04 | 2,73E+02 | 3,84E+00 | 3,99E+04 | 2,57E+01 | 1,21E+01 | 2,59E+01 | -9,49E+03 |
| SM | Use of secondary material | [kg] | 5,12E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | Use of renewable secondary fuels | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | Use of non-renewable secondary fuels | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | Use of net fresh water | [m³] | 9,74E+00 | 7,57E-03 | 3,40E-02 | 1,40E+01 | 7,11E-04 | 5,47E-03 | -6,08E-02 | -6,17E+00 |

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:** One piece of automatic sliding door system

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | Hazardous waste disposed | [kg] | 4,04E-01 | 6,22E-04 | 2,64E-04 | 3,11E-02 | 5,85E-05 | 1,68E-03 | 1,33E-03 | 1,64E-01 |
| NHWD | Non-hazardous waste disposed | [kg] | 8,92E+01 | 3,43E-02 | 2,94E-01 | 1,27E+01 | 3,23E-03 | 3,91E-03 | 1,18E+02 | -9,11E+01 |
| RWD | Radioactive waste disposed | [kg] | 9,25E-01 | 3,58E-04 | 2,24E-04 | 3,28E+00 | 3,36E-05 | 1,75E-03 | 5,59E-04 | -4,72E-01 |
| CRU | Components for re-use | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | Materials for recycling | [kg] | 0,00E+00 | 0,00E+00 | 8,25E+00 | 0,00E+00 | 0,00E+00 | 3,82E+02 | 0,00E+00 | 0,00E+00 |
| MER | Materials for energy recovery | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | Exported electrical energy | [MJ] | 0,00E+00 | 0,00E+00 | 1,48E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,40E+01 | 0,00E+00 |
| EET | Exported thermal energy | [MJ] | 0,00E+00 | 0,00E+00 | 4,17E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,83E+01 | 0,00E+00 |

## 6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D).

The production phase (modules A1-A3) contributes between 33% and 67% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production phase accounts for approx. 98% - this impact category describes the reduction of the global amount of non-renewable raw materials, therefore, as expected, it is mainly related with the extraction of raw materials (A1).

Within the production phase, the main contribution for all the impact categories is the production of steel and aluminium mainly due to the energy consumption on these processes. These two materials account with approx. 69% to the overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6), the energy consumption was included and it has a major contribution for all the impact assessment categories considered - between 33% and 66%, with the exception of ADPE (2%). This is a result of 6 hours of operation in stand-by mode and 6 hours in on mode per day and per 355 days in a year.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

## 7. Requisite evidence

Not applicable in this EPD.

## 8. References

**Institut Bauen und Umwelt**
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

**General principles**
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.bau-umwelt.de

**PCR Part A**
Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013
www.ibu-epd.de

**IBU PCR Part B**
IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for
Automatic doors, automatic gates and
revolving door systems (version 1.5 04.2017) www.ibu-epd.com

**EN 15804**
EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

**GaBi 6 2013**
GaBi 6 2013: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2013.

**GaBi 6 2013D**
GaBi 6 2013D: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2013. http://documentation.gabi-software.com/

**ISO 14025**
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**ANSI/BHMA A156.10**
Power Operated Pedestrian Doors

**UL 325 ANSI/CAN/UL**
Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems

**UL 60730 UL**
Standard for Safety Automatic Electrical Controls

**NFPA 79**
Electrical Standard for Industrial Machinery

**AHSRAE 90.1 ANSI/ASHRAE/IES Standard 90.1-2016**
Energy Standard for Buildings Except Low-Rise Residential Buildings

**2012/19/EU**
Waste Electrical and Electronic Equipment Directive (WEEE Directive)

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# Annex

Results shown below were calculated using TRACI Methodology.

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)**

| PRODUCT STAGE | | | CONSTRUCTION PROCESS STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement[1)] | Refurbishment[1)] | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse- Recovery- Recycling- potential |
| **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| X | X | X | X | X | MND | MND | MND | MND | MND | X | MND | MND | X | X | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT:** One piece of automatic sliding door system

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP | Global warming potential | [kg $CO_2$-Eq.] | 1,50E+03 | 1,45E+03 | 1,97E+01 | 0,00E+00 | 0,00E+00 | 1,85E+00 | 6,81E-01 | 1,00E+01 |
| ODP | Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 2,28E-06 | 2,08E-06 | 1,00E-10 | 0,00E+00 | 0,00E+00 | 9,44E-12 | 4,96E-10 | 4,83E-11 |
| AP | Acidification potential of land and water | [kg $SO_2$-Eq.] | 7,28E+00 | 7,05E+00 | 1,18E-01 | 0,00E+00 | 0,00E+00 | 1,11E-02 | 3,04E-03 | 1,37E-02 |
| EP | Eutrophication potential | [kg N-eq.] | 3,36E-01 | 3,31E-01 | 8,34E-03 | 0,00E+00 | 0,00E+00 | 7,84E-04 | 1,29E-04 | 1,06E-03 |
| Smog | Ground-level smog formation potential | [kg $O_3$-eq.] | 8,86E+01 | 8,71E+01 | 2,43E+00 | 0,00E+00 | 0,00E+00 | 2,28E-01 | 2,75E-02 | 2,46E-01 |
| Resources | Resources – resources fossil | [MJ] | 1,20E+03 | 1,16E+03 | 3,92E+01 | 0,00E+00 | 0,00E+00 | 3,68E+00 | 5,51E-01 | 3,02E+00 |

**RESULTS OF THE LCA - RESOURCE USE:** One piece of automatic sliding door system

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | Renewable primary energy as energy carrier | [MJ] | 3,10E+03 | - | - | - | - | - | - | - |
| PERM | Renewable primary energy resources as material utilization | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PERT | Total use of renewable primary energy resources | [MJ] | 3,10E+03 | 1,07E+01 | 3,05E-01 | 3,08E+03 | 1,01E+00 | 2,21E+00 | 2,09E+00 | -2,17E+03 |
| PENRE | Non-renewable primary energy as energy carrier | [MJ] | 1,83E+04 | - | - | - | - | - | - | - |
| PENRM | Non-renewable primary energy as material utilization | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PENRT | Total use of non-renewable primary energy resources | [MJ] | 1,83E+04 | 2,73E+02 | 3,84E+00 | 3,99E+04 | 2,57E+01 | 1,21E+01 | 3E+01 | -9,49E+03 |
| SM | Use of secondary material | [kg] | 5,12E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | Use of renewable secondary fuels | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | Use of non-renewable secondary fuels | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | Use of net fresh water | [m³] | 9,74E+00 | 7,57E-03 | 3,40E-02 | 1,40E+01 | 7,11E-04 | 5,47E-03 | -6,08E-02 | -6,17E+00 |

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:** One piece of automatic sliding door system

| Parameter | Parameter | Unit | A1 - A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | Hazardous waste disposed | [kg] | 4,04E-01 | 6,22E-04 | 2,64E-04 | 3,11E-02 | 5,85E-05 | 1,68E-03 | 1,33E-03 | 1,64E-01 |
| NHWD | Non-hazardous waste disposed | [kg] | 8,92E+01 | 3,43E-02 | 2,94E-01 | 1,27E+01 | 3,23E-03 | 3,91E-03 | 1,18E+02 | -9,11E+01 |
| RWD | Radioactive waste disposed | [kg] | 9,25E-01 | 3,58E-04 | 2,24E-04 | 3,28E+00 | 3,36E-05 | 1,75E-03 | 5,59E-04 | -4,72E-01 |
| CRU | Components for re-use | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | - |
| MFR | Materials for recycling | [kg] | 0,00E+00 | 0,00E+00 | 8,25E+00 | 0,00E+00 | 0,00E+00 | 3,82E+02 | 0,00E+00 | - |
| MER | Materials for energy recovery | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | - |
| EEE | Exported electrical energy | [MJ] | 0,00E+00 | 0,00E+00 | 1,48E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,40E+01 | - |
| EET | Exported thermal energy | [MJ] | 0,00E+00 | 0,00E+00 | 4,17E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,83E+01 | - |